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SUBJECT: SCENESETTER FOR THE U.S.-BRAZIL JOINT COMMISSION MEETING ON  
SCIENCE AND TECHNOLOGY, WASHINGTON, NOVEMBER 19-20

REF: A) BRASILIA 1254, B) BRASILIA 1105

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¶1. SUMMARY: Brazil - the giant of South America - has stepped on to the world stage as a major economic power and is a key player in regional and multilateral matters. What has been less noticeable is that Brazil has put itself on a track to eventually become a global scientific and technological (S&T) powerhouse. For the ten year period up through 2006, the number of Brazilians receiving master's and doctoral degrees increased at an annual rate of 12 percent. Similarly, the number of scientific articles published in international journals shot up an average of 8.9 percent per year from 1981 through 2006. And this trend has only accelerated in recent years. Today, one of the biggest challenges facing the Government of Brazil (GOB) is how to translate these substantial and growing S&T resources into economic growth and development. This concern undergirds their tremendous interest in how to promote innovation.

¶2. Brazil's scientific community in many areas has, or will soon have, the human, institutional and financial resources to be a full partner to the U.S. scientific community. The bilateral S&T relationship already is particularly advanced in the areas of agriculture research, biomedical research, and biofuels, and other areas of cooperative research have been growing significantly. S&T cooperation is helped by the fact that thousands of Brazilians scientists, engineers, and technicians have studied in the United States. The U.S.-Brazil Joint Commission Meeting (JCM) on Science and Technology that will take place in Washington, November 19-20 presents an opportunity for U.S. Government (USG) agencies to take a close look at Brazil and see how they would like to collaborate with this rapidly emerging S&T powerhouse. Further, there is interest in the USG and the GOB in jointly engaging in "trilateral" S&T activities with third countries in the developing world, especially with food security and health. This JCM will include a special focus on the areas of food security, climate change science, science education, and innovation. END SUMMARY

POLITICAL OVERVIEW - AN IMPORTANT INTERNATIONAL PLAYER

¶3. With democracy re-established in 1988 after decades of military dictatorship, Brazil's democratic institutions are generally strong and stable. President Luiz Inacio Lula da Silva remains, seven years into his presidency, highly popular -- one of the most popular presidents in Brazil's history and indeed in the world today. This sustained popularity is based on a combination of his personal connection with the country's lower classes, disciplined economic policies, and expanded social programs. However, the Brazilian

political elite and media are already focused on the October 2010 national elections for president, all 27 state governors, two-thirds of the senate, and all federal deputies. Lula is constitutionally barred from seeking a third term. He has designated Civil Household (Prime) Minister Dilma Rousseff as his party's candidate to succeed him. Sao Paulo Governor Jose Serra currently is the leading contender for the Presidency, but with a year to go, the race remains unpredictable. As the campaign season enters full swing in spring 2010, there will be an exodus of senior officials and some agencies may choose to wait for the next government before undertaking new activities.

¶4. The United States and Brazil share the basic goals of fostering hemispheric stability and integration, promoting democracy and human rights, and preventing transnational illicit activity. The attainment of a permanent seat on the UN Security Council has been an important goal of Brazil's foreign policy under President Lula's government. Brazil was just elected to a tenth two-year non-permanent UN Security Council seat, a record matched only by Japan. Lula has sought to expand ties in Africa and other developing countries by opening new embassies and offering them scientific and technical assistance. Brazil has taken the lead on peacekeeping in Haiti. In South America, the GOB has maintained a historic focus on stability, seeing good relations with all neighbors as the best way to achieve this goal.

#### ECONOMIC OVERVIEW - NOW ONE OF THE TOP ECONOMIES

¶5. Brazil is the tenth largest economy in the world and received investment grade status from Standard and Poor's and Fitch in 2008, and from Moody's in 2009. Annual Gross Domestic Product (GDP) grew 5.1 percent in 2008, and inflation was 5.8 percent. The global economic crisis eroded previous predictions for annual GDP growth for 2009 from four per cent to essentially flat. Despite this decline in immediate prospects, Brazil has thus so far weathered the

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crisis better than most major economies and appears to be entering into a solid recovery position, led by strong domestic demand. Conservative macroeconomic policies in the years prior to the crisis, and targeted responses during the crisis -- including credit injections in the financial system, a reduction in interest rates, and tax cuts on automobiles and consumer durables -- played a role in lessening the impact of the global crisis on Brazil. Brazil is projected to return to a 4 to 5 percent GDP growth rate in 2010.

¶6. Brazil is a major producer and exporter. Agriculture makes up 36 percent of exports, and the agribusiness sector accounts for 25 percent of Brazil's Gross Domestic Product (GDP). Brazil is a leading exporter of soybeans, beef, sugar, coffee, and orange juice. Brazil also distinguishes itself as a major exporter of civilian aircraft, steel, and petrochemicals. The United States is Brazil's top trading partner overall, and China as of March of this year moved into first position as Brazil's primary export destination. Prior to the current financial crisis, U.S.-Brazil trade experienced significant annual growth surpassing USD 50 billion in 2008 -- Brazil typically experiences a slight positive balance in the trade relationship.

¶7. Brazil's relatively successful management of the crisis has encouraged the GOB to engage proactively and constructively in the debate over how to handle the economic crisis including through the G20 process. Brazil has called for increased regulation of the global financial system, increased global access to trade finance, and an expanded voice and vote for large emerging countries like Brazil in the international financial institutions.

#### SCIENCE AND TECHNOLOGY - RISING RAPIDLY, BUT FROM A LOW BASE

¶8. Brazil has decided it wants to become a global S&T powerhouse and has been putting resources into that effort. Currently, Brazil invests about 1.2 percent of its GDP in research and development (R&D) and the goal is to reach 1.5 percent in 2010 and 2.2 percent (the OECD average) by 2015. For the period 2007-2010, the GOB has embarked on a \$41 billion Reais (about US\$24 billion) program to

promote science, technology and innovation. This S&T program aims to (1) increase substantially the number of Brazilians with advanced degrees - with a specific focus on engineering; (2) promote R&D and innovation by private firms; (3) support R&D in strategic areas - biotechnology, nanotechnology, information and communication technologies (ICT), biofuels and energy technologies, biodiversity and climate change science, and nuclear; and (4) strengthen S&T education in public schools and technology and vocational centers. The Minister for Science and Technology, Dr. Sergio Rezende (MIT Ph.D., Fulbright alumnus) would like to brief the U.S. delegation on this four-year S&T program and future plans at the JCM. The investment in S&T has already begun to show results. For the ten year period through 2006, the number of Brazilians receiving master's and doctoral degrees increased at an annual rate of 12 percent; with the number of doctoral degrees increasing from about 5,000 in 2000 to 10,000 in 2007. The goal is to reach 16,000 in 2010. The number of scientific articles published by Brazilians in international journals shot up an average of 8.9 percent per year from 1981 through 2006, and this trend continues. This growth in scientists is also apparent in the staffing of GOB agencies. A good example is the Brazilian Metrology Institute (INMETRO), which had just 5 scientists with doctoral degrees in 2000 and will have 300 such scientists in 2010.

¶9. Brazil consciously looks to South Korea as a model, where a substantial investment in S&T helped to promote rapid growth. Even with increasing spending on S&T, however, the GOB confronts fundamental challenges to this vision. The vast majority - 72 percent in 2005 - of researchers work for the government, either directly or through a government university. In contrast during the same year, over 75 percent of researchers in the United States and South Korea worked in the private sector. There is great pressure for researchers to publish in Brazil (about 2.2 percent of the world's scientific articles), however, researchers rarely patent their discoveries. In 2005, there were 2,439 patents granted in Brazil compared with 53,300 in China and 74,500 in South Korea. Dr. John Holdren, Science Adviser to the President and Director of the Office of Science and Technology Policy, stressed in his confirmation hearing that "investments in science and engineering have driven most of the innovations that underpin our economy today. A wide variety of studies conclude that between 50 and 85 percent of the growth of the U.S. economy over the past half-century." Brazil concurs with this analysis. The GOB is placing a major emphasis on

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S&T and innovation as a driver of economic growth. The GOB considers promoting innovation one of its highest priorities, and this is expected to be reflected at the JCM.

¶10. Briefly, the GOB S&T community falls mainly under the mandate of the Ministry of Science and Technology (MCT), which has two large funding agencies: the National Research Council (CNPq) for promoting individual research activities and capacity building, and the Financing Agency for Studies and Projects (FINEP), which supports S&T institution building. Minister Rezende and the presidents of CNPq (Marco Antonio Zago) and of FINEP (Luis Manuel Rabelo Fernandes) will participate in the JCM. MCT oversees a host of technical agencies, including the Brazilian Space Agency (AEB), the National Space Research Institute (INPE), and the Center for Strategic Studies (CGEE), all of which will be represented at the JCM by their head of agency. Other technical agencies fall under different ministries, such as the Coordination for the Improvement of Academic Personnel (CAPES), the agency charged with overseeing graduate-level education in Brazil, which falls under the Education Ministry; the Brazilian Agricultural Research Agency (EMBRAPA), which falls under the Agriculture Ministry; and the Metrology Institute (INMETRO), which falls under the Commerce and Development Ministry. All of these will also be represented at the JCM. Apart from these GOB agencies, the GOB plays a role in R&D through the nationwide network of federal universities. There are also some high quality state and private universities.

THE JOINT COMMISSION MEETING ON SCIENCE & TECHNOLOGY

¶11. The next Joint Commission Meeting (JCM) on Science and Technology will take place in Washington, DC, November 19-20. This

will be only the second JCM (the first one was in 2006) and the first one during the Obama Administration. The Brazilian delegation will be headed by the Minister Rezende, who will be accompanied by the Ministry of External Relations' Under Secretary for Energy and High Technology, Ambassador Andre Amado. Dr. Holdren will lead the U.S. delegation. The JCM will review the wide gamut of the bilateral S&T relationship. This meeting will include a focus on four key areas: food security; climate change science; science education and innovation.

¶12. The JCM takes place in accordance with the 1984 Agreement on Science and Technology between the United States and Brazil (the "S&T Framework Agreement"). A wide variety of USG agencies have used this Framework Agreement as the basis for an on-going and robust cooperation with their Brazilian counterparts. Some of the most active USG agencies in Brazil include the National Institutes of Health, the National Science Foundation, the Smithsonian Institution, the U.S. Geologic Survey, the U.S. Department of Agriculture's Agricultural Research Service (USDA/ARS), the U.S. Army Corps of Engineers, the National Aeronautical and Space Administration (NASA), and the National Institute of Standards and Technology. The activities undertaken by these agencies range from climate science, to medical research and everything in between.

#### AGRICULTURE BIOTECHNOLOGY

¶13. Biotechnology and genetic resources are issues that have divided the Brazilian ministries, with the Agriculture Ministry vigorously supporting increased use of biotechnology and freer flow of genetic resources, and until recently, the Environment Ministry expressing skepticism and caution on the matter. The growing use of agricultural biotechnology, including genetic engineering (GE), by Brazilian farmers and the arrival of a more pragmatic Environment Minister present an opportunity for the USG to encourage the GOB to work more closely with the USG on these key issues. Brazil has come a long way in making use of biotechnology. Post estimates that for the upcoming 2009/2010 season GE seeds will account for 65 percent of soybean plantings, 20 percent of corn plantings, and 10 percent of cotton plantings. Earlier in October 2009, the Ministry of Science and Technology together with the National Council for Scientific and Technological Development (CNPq) announced an initiative to promote biotechnology research with small grants of up to 50,000 Reais (about US\$25,000).

¶14. Brazil's Agricultural Research Service (EMBRAPA), an agency similar to the USDA/ARS, is a leader in agricultural biotechnology and research. In fact, EMBRAPA and USDA/ARS have a well-established cooperation and exchange program called LABEX. Representatives from both EMBRAPA and LABEX will be participating in the JCM.

#### CLIMATE CHANGE

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¶15. After intensive lobbying from senior USG officials and pressure from other countries and domestic constituencies, President Lula announced a major shift in Brazil's position in the international climate change negotiations. He has announced a target of reducing the rate of deforestation of the Amazon Forest by 80% by 2020, which would amount to about a 20% reduction in economy-wide emissions compared with business as usual. This represents a significant advance over Brazil's previous position that only the developed countries should have emissions reductions targets and the developing ones needed to preserve room for growth. Brazil, however, insists that developed countries provide substantial technology transfer and financial assistance to developing countries so that they can take mitigation and adaptation measures.

¶16. There is a long history of cooperation between the USG and the GOB in the science of climate change and biodiversity. NASA supported a massive project called the Large-scale Biosphere Atmosphere (LBA) Project in the Amazon, which continues with funding from other sources. The Smithsonian Institution and the National Science Foundation operate programs on climate change in Brazil. NASA provides satellite imagery that Brazil uses to monitor the Amazon. This is a potential area for greater cooperation as USG

agencies place a greater emphasis on this field of research.

¶17. The GOB has great interest in the study and understanding of climate change and biodiversity. In addition, it has an active program in R&D of advanced and next generation biofuels with the USG under the 2007 Biofuels Memorandum of Understanding. The GOB and the USG are looking for other areas to pursue S&T cooperation with respect to renewable energy, energy efficiency, carbon sequestration and storage, and nuclear energy. These efforts include Memoranda of Understanding signed by DOE's National Energy Technology Laboratory (NETL) with the Brazilian Coal Association (Associagco Brasileira do Carvco Mineral) and the Pontifical Catholic University of Rio Grande do Sul (PUCRS - Pontificia Universidade Catslica do Rio Grande do Sul). Both MOUs place special emphasis on exchanging information on coal utilization for power generation and clean fuels production, including coal gasification; efficient and environmentally responsible use of coal; development of combustion technologies for high-ash coals; studies in coal mine safety, coal mine methane, mine ground water control, backfilling, and acid mine drainage; coal GHG mitigation technologies, including CO2 capture and storage; and, capacity building for the above technologies. DOE is also supporting work by the National Renewable Energy Laboratory and Argonne National Laboratory with Brazilian counterparts to evaluate the life cycle greenhouse gas emissions and land-use impacts of advanced processes for biofuels production in Brazil and the United States.

¶18. Furthermore, Brazil has developed excellent skills in remote sensing and imagery analysis, which it uses to monitor the Amazon Forest. INPE, the agency primarily responsible for this work, would like to find ways to provide these skills to other developing countries with tropical forests. The GOB is interested in the possibility of trilateral cooperation with the USG in this area.

#### FULBRIGHT AND HIGHER EDUCATION COOPERATION

¶19. The Fulbright Program offers grants for graduate and post-doctoral studies in all fields of knowledge. The Fulbright Program in Brazil, which dates back to 1957, has awarded grants for 3,000 Brazilians for educational programs in the United States and for 2,500 Americans for educational programs in Brazil. Of the Brazilians who have gone to the United States, 286 participated in science or technology programs, and 83 Brazilians are currently studying in the United States in scientific or technical fields. Since its inception in 2007, four Brazilians have been selected for the International Fulbright Science and Technology Award for Outstanding Foreign Students, which provides winners the opportunity to pursue a Ph.D. at top U.S. universities. This award is considered the most prestigious international scholarship in science and technology. In addition, two Brazilian scholars were selected to take part in the 2010 Fulbright New Century Scholars Program, the theme of which is "The University as Innovation Driver and Knowledge Center." Now in its sixth year, this program provides a platform for a group of outstanding scholars from around the world to focus on a single issue of concern to people, institutions and governments worldwide. The selected scholars, one-third of whom are from the United States and the rest from other countries, spend a year conducting research, both individually and collaboratively, to advance understanding on the year's chosen topic. It is very

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unusual to have two scholars from the same country participate in this program, which speaks to the quality of the Brazilian applicants.

¶20. The Fulbright Commission in Brazil works in close collaboration with CAPES, a Brazilian federal agency charged with overseeing graduate-level education in Brazil. CAPES also supports a variety of scholarships for Brazilian students and scholars to study and conduct research abroad. This year Fulbright and CAPES will phase out the four-year PhD program and launch in its place the Fulbright Doctoral Dissertation Research Award Program, which will provide a nine-month research grant for Brazilian doctoral students enrolled in Brazilian universities who wish to study or do research at U.S. institutions to complement their studies and research in Brazil. The priority areas for these grants will be fields of study related to

science and technology. In the first year, 40 grants will be offered, and the goal is to increase the number to 50 in the coming years. A call for applications for this program will begin in November of 2009 and the first students will depart in the fall of 2010.

¶21. Since February of 2008, the Fulbright Commission in Brazil has coordinated the Brazil-U.S. Higher Education Council Bio-Fuels Network, which aims to create a framework to enhance information exchange and facilitate research collaboration and partnerships between scientists, universities and research institutions in Brazil and the U.S. in the area of biofuels. The Network has established an active website that includes an international database to connect researchers from United States and Brazilian institutions that currently includes 140 Brazilian and U.S. researchers and professionals working in the area of biofuels. The Network organized an annual short course on biofuels, the first of which was held at the University of Sao Paulo from July 27-August 7 of this year. The course takes an interdisciplinary approach to bio-energy and biofuels technologies and aims to improve communication among institutions of higher education, science, and other public and private organizations in Brazil and the U.S. Participants included Brazilian and U.S. graduate students, as well as private sector professionals. The Network hopes to increase its activities by seeking funding for joint proposals developed by Network members, starting webinars and a bi-monthly e-newsletter. The Bureau of Educational and Cultural Affairs (ECA) has only provided the Network with funding for two years. ECA is currently evaluating the program to determine if it will extend funding beyond December of 2009.

#### INNOVATION

¶22. Brazilian officials continue to point to innovation as one of their highest priorities and have indicated interest in increasing cooperation in this area. Continuing bilateral discussions on innovation would provide the USG with an excellent opportunity to highlight the importance of intellectual property rights (IPR) as a pillar of innovation. However; there is some resistance (particularly from the Ministry of External Relations) to linking conversations on innovation, economic development, and intellectual property protection. This resistance seems to be motivated by the Ministry of External Relations' political desire for Brazil to take a leading role among developing nations and a policy belief (led by Ministry of Health) that pharmaceutical patents contradict the public interest by limiting access to medications. Furthermore, the Ministry of External Relations' consideration of cross-retaliation on IPR (in the World Trade Organization cotton dispute) could be perceived as a lack of commitment to the long-term value of IPR in attracting and promoting innovation. Participants from the Ministry of External Relations will not eagerly seize on the theme of innovation's ties to IPR protection. However, officials and ministries dealing with industry and trade are more aware of IPR's importance to economic development and growth. The powerful Sao Paulo Industry Federation (FIESP) as well as other Brazilian private sector representatives have indicated concerns regarding proposals to cross-retaliate on IPR in the cotton case.

#### ASSISTANCE AND TRILATERAL COOPERATION

¶23. Bilateral development assistance in Brazil is diminishing as Brazil's economy advances, notwithstanding the areas of continued extreme poverty and sharp regional disparities. Germany and the European Union lead assistance efforts tend to focus on forest conservation and sustainable development, while the United Kingdom is devoting its assistance efforts almost entirely to climate change mitigation and carbon-free economic growth. USAID has modest assistance programs in Brazil directed at health and youth

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employability in the poor Northeast and to sustainable development in the Amazon. While the GOB accepts limited development aid, it does not actively seek assistance, even during natural disasters such as the recent flooding in the Northeast and the Amazon region.

¶24. Brazil is taking on a new role as a provider of development assistance, rather than a recipient. Together with Brazil's

Ministry of External Relations, USAID is developing an MOU that will establish triangular development assistance relationships with Haiti and with Portuguese-speaking African countries in the areas of food security and health. The GOB is confident that it is in a position to showcase its agricultural expertise and experience in HIV/AIDS treatment. The GOB actively seeks a partnership of equals with the USG and other developed countries to apply this experience in other developing countries. The USG and GOB have already commenced a project in Sao Tome to address the problem of malaria there. Further, the USG has repeatedly called on Brazilian medical specialists to assist its health assistance programs in Africa.

¶25. Possible areas of trilateral cooperation extend beyond food security and health. Since signing the Biofuels Cooperation Memorandum of Understanding in March 2007, the USG and the GOB have been working together to assist developing countries in the Caribbean, Central America, and now in Africa in making science based decisions about biofuel policies. Moreover, the USG and GOB are conducting joint research on advanced and next generation biofuels. We are also discussing possible joint cooperation on hydropower in Haiti and have seen initial interest in how the USG and the GOB might utilize their impressive assets and skills in remote sensing and earth observation to benefit other tropical forest countries.

#### BARRIERS TO RESEARCH AND COOPERATION

¶26. Despite strong interest for increased cooperation on a technical-level, S&T cooperation between the GOB and the USG has occasionally been plagued by bureaucratic and political obstacles. Dr. Nina Fedoroff, during her visit to Brazil in late October, had several conversations with her counterparts about these "barriers to cooperation." From the USG perspective, these barriers often take the form of onerous customs procedures; constantly changing, multilayered research authorization requirements; and particularly lengthy and difficult procedures required to receive government permission for any research involving health, genetic resources, or traditional knowledge. From the GOB perspective, the most commonly cited "barrier" is the cost and procedure involved in obtaining a U.S. visa. The JCM will provide an opportunity for both sides to discuss these barriers, and ways to reduce them in an effort to increase cooperation.

#### U.S. DEFENSE DEPARTMENT S&T INTERESTS IN BRAZIL

¶27. The United States was a direct contributor to the birth of the Brazilian Aerospace Industry. In 1945, Brazilian Air Force Col Montenegro visited Wright Patterson AFB and MIT. These visits resulted in Col Montenegro and MIT Professor Richard Smith establishing what is today known as the Aerospace Technical Institute (ITA), the Department of Aerospace Technology (DCTA) and the successful aircraft manufacturer EMBRAER, which is now a private company. Very intense cooperation throughout the 1960s transitioned to a decline in military S&T cooperation during periods of human rights violations and military dictatorship in Brazil. The Brazilian military and the U.S. military continue to work to increase collaborative efforts after a long lull in cooperation. The Brazilian military has emphasized that they have been faithful custodians of U.S. sensitive technologies, while at the same time expressing resentment over what they label as embargoes on technology transfer. In response to the misuse of the term embargoes, DTSA had a briefing team clarify to the Ministry of Defense that most of the complaints related to commercial contractual issues with private companies and not USG trade control issues. S&T dialogues are held at the General Officer Level on an annual basis, alternating between Brazil and the United States. These meetings are referred to as National Executive Agent Meetings. The Brazilian Air Force Executive Agent, Brigadier General Venancio will be participating in the JCM. While Venancio would like a return to the cooperation of the 1950's and 1960's and has great respect for the United States, he is one of the officers who has accused the USG of having "embargoes" against technology transfer to Brazil.

¶28. The Air Force Office of Scientific Research (AFOSR) has

collaborative efforts with military and civilian universities. Extensive interest in Brazil led to a proposal to open a regional office in Brazil, however, due to Brazilian political resistance, this regional office had to be established in Santiago, Chile. The Brazilian Air Force is particularly proud of its cutting edge hypersonic research, which is being conducted in collaboration with the U.S. Air Force. If the Super Hornet is selected in the F-X2 competition the Brazilian Air Force will receive a Tri-sonic wind tunnel as a Boeing offset which will significantly improve their aerospace research and development capabilities.

¶29. One of the most significant visits in the area of S&T was a visit by former DARPA Director Dr. Tether in September of 2008. The intent was to discover collaborative opportunities and hopefully generate interest in submitting White Papers to DARPA with collaborative project proposals. Great interest was expressed during Dr. Tether's visit, but no DARPA collaborative projects with Brazil have yet emerged.

¶30. The GOB has a high regard for the scientific know-how and technical prowess of the U.S. Army Corps of Engineers (USACE). USACE has a robust engagement plan with the Brazilian Army Engineers. USACE has worked closely with the GOB on potential cooperation on ports management, dredging and transmodal cargo operations as well as waterway navigation and management. USACE has been invited to accompany the Brazilian Military and the Brazilian Agency for Cooperation (ABC) on a visit to the future site of the Artibonite 4C Dam in Haiti to explore possibilities of technical cooperation in the region. In September 2009, USACE sent a team to assist the Brazilian Waterways Agency (ANA) with an assessment of the Navigability of the Teles Pires - Tapajos river. USACE is currently looking at forming a formal cooperation agreement with ANA. An important annual event between USACE and the Brazilian Army engineers is the annual Chief of Engineers visits, alternating host countries every year.

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